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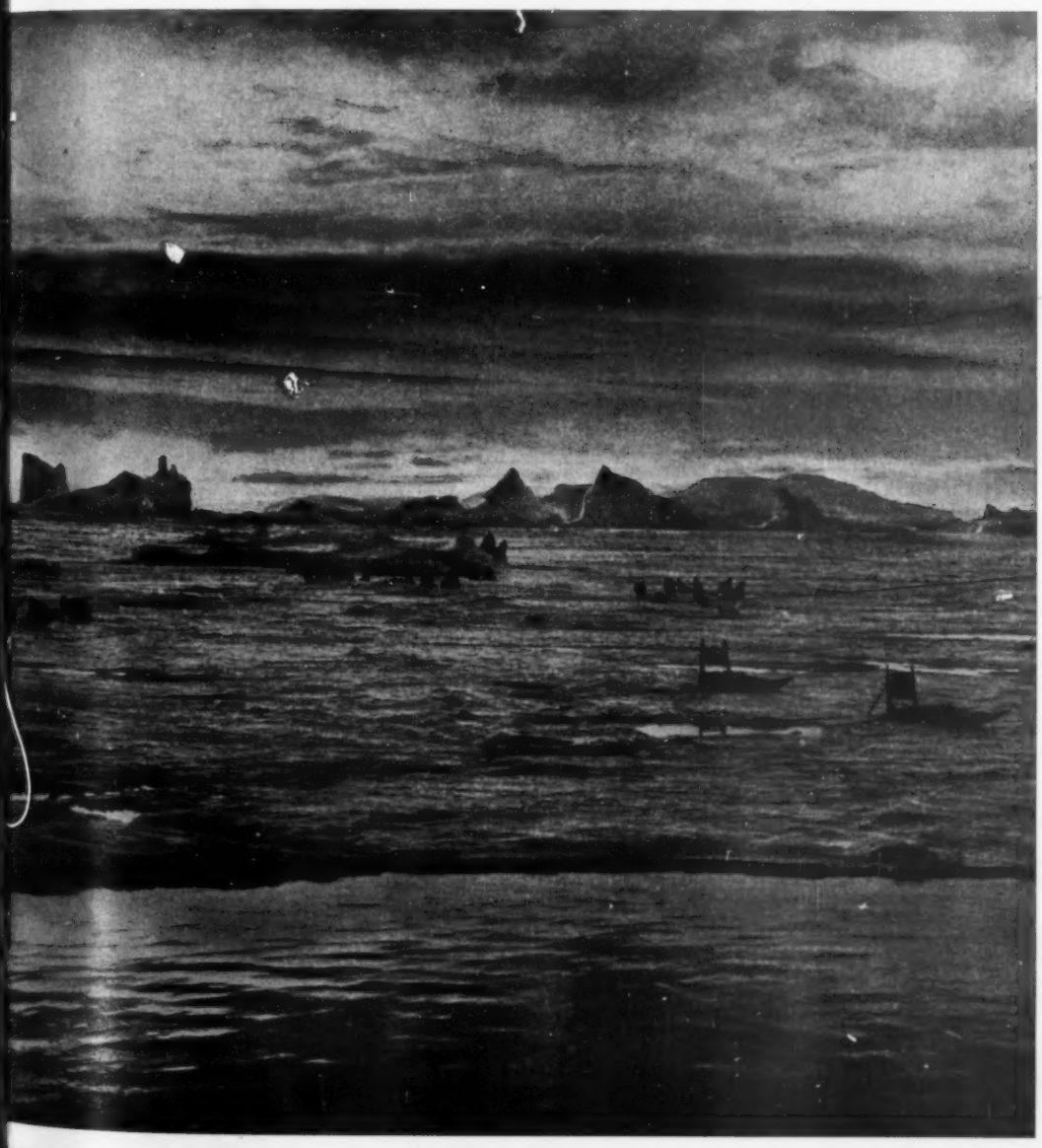

Volume XII May, 1912 Number 5

American Museum of Natural History

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The American Museum Journal

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MARY CYNTHIA DICKERSON, *Editor*

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GEORGE BORUP, EXPLORER

The Arctic explorer to-day has not the incentive of illusions as in previous centuries; truth has been separated from legend as to what may be expected in the North; and the work of the explorer stands forth in the light of scientific research merely — as a difficult task for the sake of knowledge

The American Museum Journal

VOL. XII MAY, 1912 No. 5

GEORGE BORUP—IN MEMORIAM

WITH a profound sense of its loss, the American Museum of Natural History records the death of George Borup, assistant curator of geology and one of the leaders of the Crocker Land expedition [1] scheduled to sail from Sydney, Nova Scotia, July 20, 1912. The loss is a lamentable one and on its professional side is forcibly accentuated in our minds by that very high esteem for the young explorer, which has been variously expressed in the letters and official documents of the expedition, as illustrated in the following:

1, SAVILE ROW,
BURLINGTON GARDENS, LONDON, W.,
March 29, 1912.

MY DEAR BORUP,

The programme of the Crocker Land expedition, along with a communication from Colonel Feilden has been placed before the Council of the Society for their information. I am directed to inform you that they place the highest value on the object which the proposed expedition has in view and thoroughly appreciate the care with which the programme has been drawn up, so as to lead to the most satisfactory scientific results and to the extension of our knowledge of any lands that may exist to the north of the American Arctic Archipelago as it is known at present.

The members of the Council are greatly gratified to note the very thorough training which you yourself have undergone in order to qualify you to carry out the work on the best possible lines. They ask me to assure you that they will watch the progress of the expedition with great interest and with the assurance that you will be able to bring back a rich harvest in all departments of geographical science, all the more so as we have the pleasure of reckoning you among the Fellows of our Society.

Yours very truly,

(Signed) J. S. KELTIE
Secretary of the Royal Geographical Society

The loss to the institution and to the scientific world is heightened also by the memory of the evening of the polar celebration at the Museum (April 5), when in listening to the address by Peary we heard Borup's equipment for polar exploration given this greatest living explorer's unparalleled tribute of praise:

And I doubly congratulate the Museum on putting the expedition in charge of my two boys, Borup and MacMillan, than whom no two men could be better fitted for the work by physique, temperament, experience and inclination.

When I recall their sledge journey from Cape Sheridan to Cape Morris K. Jesup and their return from there, covering two hundred and seventy-five miles in eight marches; when I recall their work establishing depots westward along the north coast of Grant Land, and

[1] For complete description of the Crocker Land expedition see the JOURNAL for March, 1912; also the article by Rear Admiral Robert E. Peary in the present number.

when I recall their work with me on the journey to the Pole, I speak with definite knowledge when I say to the Museum and its friends that it has placed the execution of the work in good hands and that the work will be done and well done.

In the following brief memorial sketches the American Museum expresses its sorrow through the words of its president, Henry Fairfield Osborn and its curator of geology, Edmund Otis Hovey; and Yale University through those of its Silliman professor of geology, Herbert E. Gregory.

THE MEMORY OF GEORGE BORUP AN INSPIRING CHAPTER IN THE HISTORY OF THE AMERICAN MUSEUM

The staff of the Museum has never sustained so sudden and so sorrowful a blow as that which came with the death of young George Borup. Only three weeks before at the great meeting held in the Museum lecture hall, a distinguished company had assembled to celebrate the achievement of the two Poles and to bid Godspeed to the new expedition to the North. All was propitious, yet at the time it was certainly in the minds and hearts of all that some dread disaster of the North might prevent the return of one or both of these young explorers. Such is often the price which man must pay for the new knowledge that is given to the world and which both these young men were ready to pay. But no one dreamt of disaster near at home.

Now all the plans for geographic work and for this expedition, which are the result of months of preparation, must again be considered under these suddenly changed conditions.

The only consolation which can be extended to those of his friends who are suffering most is that it is given to few men to achieve so much, to give so rich a promise, and to be loved and mourned by so many as young George Borup. We shall always cherish his memory and life in the Museum as one of the brief but inspiring chapters of our history.

HENRY FAIRFIELD OSBORN
President of the American Museum of Natural History

GEORGE BORUP — A BRIEF BIOGRAPHICAL SKETCH

George Borup, assistant curator in the department of geology and invertebrate palæontology, met death late in the afternoon of April 28, 1912, near Crescent Beach, Connecticut, from accidental drowning through the capsizing of a canoe. He was with his friend, Samuel W. Case of Norwich, Connecticut, who also was lost.

George Borup was the son of Lieutenant Colonel H. D. Borup, U. S. A., retired, and was brought up by his father to have military ideas of honor, uprightness and chivalry. Educated at Groton School and Yale University, he was graduated with the degree of bachelor of arts from the latter institution in 1907. He then went into the mechanical department of the Pennsylvania Railroad at Altoona; but the yearning for travel and exploration, particularly in the Arctics, was strong within him and he was not content till he persuaded Rear Admiral (then Commander) Peary to give him a place as assistant on the north polar expedition of 1908–1909. Loyal to the last degree in every spot where he was placed, young Borup was finally intrusted with important commissions on the accomplishment of which Peary commends him highly. Buoyant in his enthusiasm and boundless in energy, he was the life of the ship "Roosevelt" during the long night at Cape Sheridan and on the trying sledge journeys. He kept a diary which developed into the book, *A Tenderfoot with Peary*, which gave the world in vivid language the human side of an Arctic expedition as it never had been given before.

Borup returned from the North imbued with an idea of the value of scientific exploration and determined to devote his life to it. He came to the writer of this sketch in the fall of 1909 and said, "This Museum seems to me the best place in the world for a fellow; do you think, Sir, that if I were to study and work like the dickens three or four years I could get a job here?" Circumstances however were not favorable just then and he went back to work in the shops at Altoona. Nevertheless nothing could daunt the young man or turn him from his cherished purpose. Seeing his determination, the Museum formulated a general line of work and study and he went at it: first on the United States Geological Survey where he spent the field season of 1910 on topography, then at Yale, where the professors in the department of geology took the greatest interest in him and designated the branches of study that he should pursue. Diligent application proved his worth and brought out the fine quality of his mind.

The vacation season of 1911 was spent partly in the college geological camp in the mountains of Virginia and partly in work as an assistant in the department of geology and invertebrate palæontology in the Museum. In the fall, Professor Gregory of Yale was so favorably impressed with the progress being made by the young enthusiast, that he warmly indorsed him for the scientific leadership of an expedition to the far north to verify the existence of Peary's Crocker Land and to do scientific work along many lines — a great enterprise in which he was to share credit equally with Donald B. MacMillan, another of Rear Admiral Peary's trusted assistants in 1908–1909.

Now on the eve of departure, with success assured as far as adequate equipment in every respect could assure it, with a brilliant career opening

promisingly before him on his return from the North, trained in mind and body to seize and make the best use of every opportunity, George Borup is snatched away at the early age of twenty-seven. Great hopes are buried with him. Clean and courageous, modest, earnest and lovable, captivating in personality, loyal to his ideals and his friends, his brief career has been a blessing and his untimely death leaves a wound that will long remain fresh in the hearts of his friends. The loss to science furthermore, is as great as that to his friends.

EDMUND OTIS HOVEY
Curator of Geology, American Museum of Natural History

TO DO A MAN'S WORK, TO PROVE HIMSELF WORTHY OF HIS OPPORTUNITIES WAS THE RULING MOTIVE OF HIS LIFE

Twenty-seven years is a short span of life; a period required for the unfolding of latent power and necessarily devoted to preparation for work of maturer days. Yet during this period, George Borup had done a man's work while retaining a joyous boy's spirit. His accomplishments in Arctic work were those of the seasoned explorer; his enthusiastic devotion to Peary, his unrestrained praise and affection for Marvin and for his other companions in the struggle with frigid nature, showed the simple-minded, generous boy.

The future held important and serious work for Borup — work which in a very direct way was destined to widen the bounds of human knowledge, and for which he was amply prepared. During the past two years, in which the tasks before him were constantly in mind, no detail of his mental or physical equipment was too small to engage his earnest attention. Such a supplement of adequate training, with character and personality and an eagerness to do more than one's share of drudgery and routine work, makes an ideal equipment for a scientific explorer, and the grouping of these qualities in Borup justified the confidence placed in him by his critical scientific instructors, as well as by his closer friends and college companions. There was not a selfish or unkind streak in his whole magnificent body, and it was most natural to view him not only with respect and admiration, but also with genuine affection. To make a name for himself seemed no part of his interests; to do a man's work, to prove himself worthy of his opportunities, was the ruling motive of his life. Borup maintained the most cherished Yale traditions, and I find myself comparing him with Nathan Hale — a glad-hearted boy overflowing with love for life, yet not in the least afraid to die.

HERBERT E. GREGORY
Silliman Professor of Geology, Yale University

Donald B. MacMillan, member of Peary's last polar expedition and one of the proposed leaders in the exploration of Crocker Land

THE CROCKER LAND EXPEDITION

By Robert E. Peary

The following article written for the JOURNAL by Rear Admiral Peary of the United States Navy, the man who through many years of difficult experience knows practical conditions in the North, gives us an authoritative opinion on the importance of the expedition, the possibilities of alluring or startling results and the fitness of the chosen leaders. — Editor.

THE exploration of Crocker Land easily takes first rank among problems demanding exploration, now that the Poles have been reached and that the insularity of Greenland has been determined, the latter at one time considered the second large work of importance in the Arctic regions. And further than this, should this land, the distant mountain peaks of which I was fortunate enough to see from the summit of Cape Thomas Hubbard in July, 1906, prove to be a land of large extent, the possibilities will be most alluring, for such land will become the gateway to other lands or seas represented by the large blank space on the maps between the North Pole and Bering Strait.

As to the likelihood of startling results from this exploration, in the way of a new people, or new animals or climate, long experience in the North has

led me to be the reverse of enthusiastic. Such possibilities have been suggested by some, of different human inhabitants, or of a new fauna or flora; but the probabilities amount essentially to a certainty that the fauna and flora of Crocker Land will be identical with those of northern Grant Land, although of course there is likely to be some variation. There is no question as to the possibility of a distinctly different geological formation, and there is always the chance of mineral deposits, among which graphite, mica and cryolite are no doubt most to be expected. Thus perhaps, the work of the Crocker Land expedition will not only fill with definitely outlined land and sea a large area of what is now blank space on the map, but in case this land prove extensive may fill it also with interesting details.

It may surprise as well as interest many to know that the second item in the program of this expedition, namely, the crossing of Greenland from the west coast to the east coast somewhere in the vicinity of the seventy-eighth or seventy-ninth parallel, will be a trip which in length, the elevation attained and the conditions under which it must be accomplished, will be almost a repetition of the journey of Amundsen from the Bay of Whales to the South Pole, and that of Scott from MacMurdo Sound to the Pole. This traverse of the great inland ice cap of Greenland if accomplished, will be the most important of any of the interior journeys yet undertaken in the Arctics.

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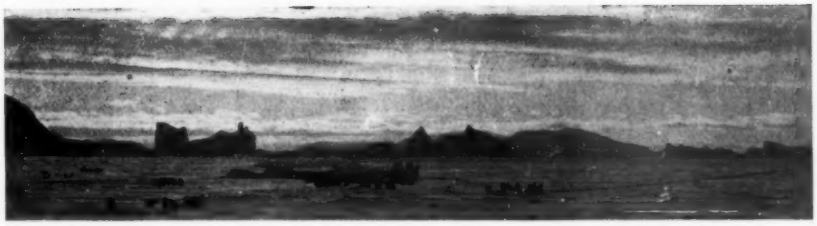
Cape Thomas Hubbard from which the Crocker Land expedition must start northward over the sea ice in search of the unknown country



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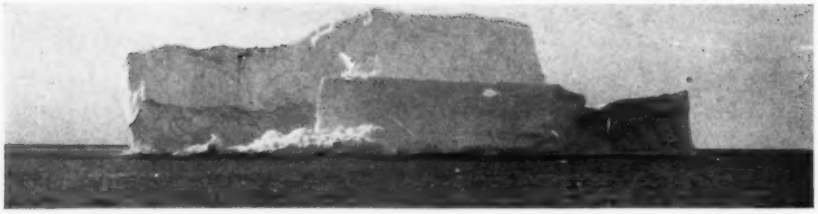
ESKIMO MOTHER AND CHILD

There is little likelihood that human inhabitants on Crocker Land — if there should prove to be such — will be different from those of Grant Land and neighboring regions to the south. The fauna and flora also of the new land will no doubt prove identical with that of Grant Land



A third work, which if the expedition has time will be of the greatest interest and importance, both to geographers and oceanographers, will be the running of deep-sea soundings northward beyond the edge of the continental shelf from various points on the coasts of Greenland and Grant Land, extending from Cape Morris K. Jesup on the east to Cape Thomas Hubbard on the west (some seventy degrees of longitude). These soundings will determine the limits of the continental shelf and the proximity of oceanic depths to the land. I should suggest a series of such soundings running north from Cape Thomas Hubbard, Cape Colgate, Cape Richards, Cape Joseph Henry, Cape Bryant, Cape Washington and Cape Bridgman, supplementing those made by the last expedition of the Peary Arctic Club from Cape Columbia and Cape Morris K. Jesup.

The American Museum is to be congratulated upon its initiative in making it possible for this expedition to go into the field, and it is to be

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Scanning the horizon in the vast Arctic wilderness

doubly congratulated that it is intrusting the expedition to my two tried men, George Borup and Donald B. MacMillan, both of whom are ideally fitted for the thorough accomplishment of the work.

The Crocker Land expedition calls forth the enthusiasm of the Arctic explorer. With its objects the accomplishment of the still remaining large items of work in the Arctic regions; with its personnel one that is in possession of the inestimable advantage of thorough experience and training in details and methods, together with knowledge of the region in which the work is to be prosecuted; with its backing that of one of the most influential of American institutions; with a sufficient proportion of the necessary funds already in hand, to insure securing the entire amount — the Crocker Land expedition under the auspices of the American Museum of Natural History and the American Geographical Society, seems to be one of the most enviable of recent exploring ventures.

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Last view of the sun in the country where for four months of the twelve exploration work must proceed in darkness

GEOGRAPHICAL EXPLORATION AND THE MUSEUM

QUOTATIONS FROM AN ADDRESS BY HENRY FAIRFIELD OSBORN WHO AS PRESIDENT OF THE AMERICAN MUSEUM OF NATURAL HISTORY AND MEMBER OF THE HONORARY COMMITTEE OF THE CROCKER LAND EXPEDITION, PRESIDED AT THE POLAR CELEBRATION OF APRIL 5, THE THIRD ANNIVERSARY OF THE DISCOVERY OF THE NORTH POLE. THE ADDRESS WAS DELIVERED BEFORE MEMBERS OF THE NATIONAL, PHILADELPHIA AND AMERICAN GEOGRAPHICAL SOCIETIES, OF THE AMERICAN MUSEUM OF NATURAL HISTORY, THE PEARY ARCTIC CLUB, AND REPRESENTATIVES OF THE NORWEGIAN AND DANISH GOVERNMENTS

THE Crocker Land expedition will be the seventh expedition leaving the harbor of New York for north polar seas. The second Grinnell expedition, in search of Sir John Franklin, which was commanded by Elisha Kent Kane, sailed from New York, May 30, 1853. Charles Francis Hall left New York in the "Polaris" July 3, 1871, in command of an expedition to the North Pole. He died in the Arctics in November, 1871. George Washington de Long was born in New York City and was in command of the "Jeannette" expedition in 1879 which was financed by James Gordon Bennett. Lieutenant de Long died in Siberia in October, 1881. His body and those of his companions were discovered by Chief Engineer George W. Melville. The Greely relief expedition in 1884 sailed

from New York under the command of Captain Winfield Scott Schley. The Peary expedition of 1905 and the Peary expedition of 1908 both sailed from New York.

Of these seven expeditions the Museum is identified more or less directly with three. An honorable part of the history of the institution however, is formed by the geographical work it has accomplished through expeditions other than polar. In the years 1865 to 1868 Professor Albert S. Bickmore visited the South Sea Islands and China, and was probably the first American to cross Siberia. In 1900 to 1902 Messrs. Bogoras and Jochelson on the Jesup North Pacific expedition, in connection with their investigations of the tribes in eastern Siberia explored the regions visited. In 1898 to 1899 Mr. Andrew J. Stone secured important information about the general character of the country east of the mouth of the Mackenzie and corrected gross errors in the current maps of the region. Captain George Comer spent many winters in the Hudson Bay region and has recently published in the *Bulletin* of the American Geographical Society a corrected map of Southampton Island.

There have also been many American Museum expeditions of a semi-geographical character. Dr. E. O. Hovey visited the West Indies and the Chihuahua district of Mexico to study volcanoes. Professor Henry E. Crampton has conducted three expeditions to Tahiti and the South Sea Islands, and a recent expedition to British Guiana and Mount Roraima. Mr. Frank M. Chapman has covered more than 65,000 miles in collecting materials for the Museum bird groups, and more recently has visited the United States of Colombia. Many of the expeditions of the department of vertebrate palæontology have yielded more or less important geographical facts.

In addition the Museum's Arctic expedition in the field the past two years under the leadership of Messrs. Stefánsson and Anderson has traversed the unexplored area between Cape Parry and the Coppermine River; and during the same years, the Congo expedition in charge of Messrs. Lang and Chapin has been working through little-known jungles of Africa.

Every time a man extends our knowledge of the unknown, his example raises the whole human race a little higher than it was before and places all the present generation and all future generations in his debt. The members of the American Museum and of the American Geographical Society give their warm support to the young men who are planning to start out on the Crocker Land expedition. We believe in the great objects of their journey to the north polar sea; we have the utmost faith in them, in their courage, their high purpose and their intelligence; and we shall do our best to supply them with the sinews of exploration — namely, funds sufficient to care for them, their Eskimo and their dogs, as well as to enable them to make scientific observations, records and collections.

Through courtesy of Popular Mechanics Magazine

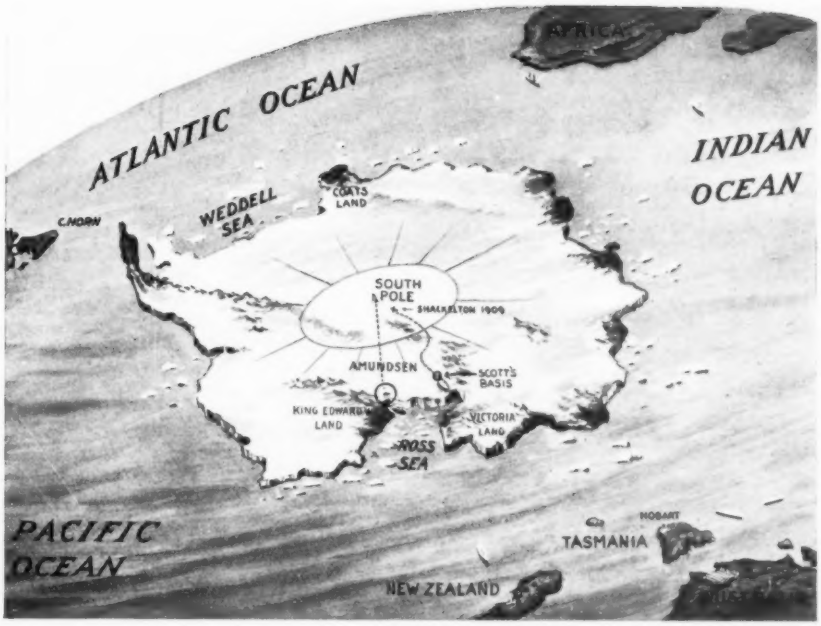
There is shifting ice over deep sea at the North Pole making all exploration a hazardous venture

ARCTIC AND ANTARCTIC EXPLORATION COMPARED

QUOTATIONS FROM AN ADDRESS BY REAR ADMIRAL ROBERT E. PEARY, U. S. N., ON THE OCCASION OF THE POLAR CELEBRATION AT THE AMERICAN MUSEUM OF NATURAL HISTORY ON APRIL 5

THE contrast between fundamental physical conditions at the North Pole and the South Pole is most striking. The North Pole is located in a deep polar sea basin. The South Pole is located on a great elevated snow plateau of unusual altitude. From this striking contrast in physical conditions, arises and results the great advantage which south polar exploration has over north polar — namely, that it can be carried on over a permanent fixed surface remaining the same from year to year, instead of over the treacherous and unstable surface of an ice-covered ocean.

North polar exploration antedates by many years the first south polar attempts. For nearly four centuries the quest of the North Pole fired the imagination and spurred the efforts of adventurous and ambitious men of many nations. Great Britain, Holland, Russia, Germany, Norway, Sweden, Spain, Austria, Italy and America sent out expeditions which took part in the stern race in which the invariable reward was failure and the frequent prize, death. Among the names that will always be famous in



Through courtesy of Popular Mechanics Magazine

At the South Pole there is land which lessens danger and gives permanent landmarks

this connection are those of Barentz, Bering, Wrangell, Hudson, Baffin, Parry, Franklin, Nordenskjöld, Koldewey, Weyprecht, Kane, Hall, Markham, Lockwood, Melville, Nansen and Abruzzi.

South polar exploration dates back but one hundred and forty years. As a matter of fact serious attempts to penetrate the Antarctic continent date back only to the beginning of the present century, twelve years ago.

Though the Antarctic circle was entered for the first time by Captain James Cook in 1773, no landing appears to have been made on the Antarctic continent until 1895; no expedition wintered inside the Antarctic circle until 1897, and no real penetration of the continent was effected until

The musk ox is an invaluable source of food supply in north polar exploration

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An expedition which penetrates the region of sea ice north of Grant Land must make deep-sea soundings to determine the limits of the continental shelf

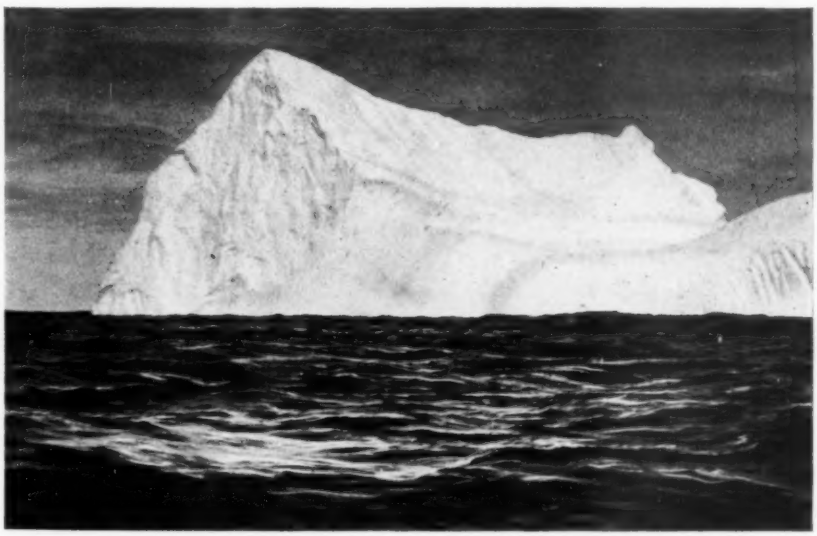
Young Eskimo dogs. For exploration in north or south polar regions the dog is more valuable than other animals because of its adaptation to any sort of food

In north polar exploration the route over the sea ice may often be blocked by open water

1902, when Scott reached 82 degrees 17 minutes south latitude, a distance of two hundred and seventy-seven miles from his winter quarters.

Up to the present time, with the exception of the Ross Sea route, developed by the British directly south from New Zealand, no work has been done in the Antarctic by a powerful steamer fitted for ice work. There are very attractive possibilities for a ship of the Roosevelt class in Weddell Sea, in the bight between Kaiser Wilhelm II Land and Kemp Land, and between King Edward VII Land and Alexander I Land.

With the attainment of the South Pole effected, there remains now another traverse from the opposite side of Antarctica to the Pole, which



Icebergs menace ships in north or south polar seas. There is still opportunity for large results in exploration in the seas surrounding the south polar continent for an ice-fighting ship like the Roosevelt

Penguins literally swarm in Antarctic regions, occupying every available space near the sea

with the journeys of Amundsen and Scott will give us continuous traverse section of the Antarctic continent, and then the filling in of the remaining unknown interior and circumference of that great region. The German expedition under Lieutenant Filchner and the Australian expedition under Dr. Mawson may be counted upon to make extensive inroads upon this terra incognita. But there will still be ample work left for an Antarctic expedition from the United States, which I earnestly hope may materialize, as a matter of national duty, privilege, prestige and morale.

Turning to the north polar regions with the attainment of the Pole effected, there remain two very interesting problems — namely, the exploration of Crocker Land and penetration of that remaining large unknown area lying between the North Pole and Bering Strait, and second, the crossing of Greenland at its widest part near the seventy-eighth parallel from Whale Sound to Cape Bismark.

As I think of the possibilities of the first, I can hardly restrain my enthusiasm and I long for just enough of that fabled fountain of youth to wash away some twenty years. I can hear the eager yelping of the dogs, the shouting of the drivers and the forward rushing of the sledges, as after days of weary travel across the ragged sea ice, every man and dog spurts for the shore of that untrodden land lying a few yards ahead in the brilliant Arctic sunlight.

THE EXHIBITION OF FISHES

By Bashford Dean

FISHES, as every museum has found to its cost, are among the least satisfactory objects to exhibit to the average visitor. They are soft-bodied, mucous-covered creatures, which appear at their best only under water; they shrink in the air, lose their colors, wrinkle, and often appear little like living animals. In most museums they are exhibited preserved in fluid, sometimes delicately painted before they are placed in jars. They are apt however to be shrunken, opaque, faded and generally unattractive, so that a visitor may pass them by and have but an imperfect idea of the *real* fishes, their graceful or curious forms and their beautiful colors. Many a person, for this reason only, has failed to find how interesting the fishes are, and how important in the economy of nature.

How to exhibit fishes satisfactorily is a great puzzle. If they are not to be installed in jars, and this method of display is becoming less and less common in museums, mounted specimens, as usually shown, are nearly as unsatisfactory. Their scales curl up in course of time, the fins warp, and altogether the result is unnatural, sometimes grotesque.

In a few museums, notably in Brooklyn and Chicago, efforts have been made to exhibit fishes as though living in aquaria. In these instances effective backgrounds are introduced and stuffed fishes are painted and posed in lifelike fashion. This development is certainly, from the popular point of view, an advance over earlier systems. Casts have also been used to advantage when these were taken from fishes before they had shrunken in contact with air. This method was developed a generation ago by the United States National Museum, and numerous copies of casts were distributed to galleries here and abroad. In general however, casts of this kind lacked much of the feeling of the actual specimens: fins and similar delicate structures were not well represented in plaster, and various technical difficulties, including the matter of coloring, prevented the usual cast from being a successful portrayal of the living fish.

In the exhibition of fishes in the American Museum of Natural History there have, until recently, been used only (1) plaster casts of the National Museum type, and (2) mounted skins, some of which, prepared by careful taxidermists and colored from fresh material, were the points of departure in our present work. Where skins or casts were not available, the required types were represented by models, and in these, better poses could sometimes be given. Of necessity however, model-making was a laborious process, for the greatest care had to be used in obtaining accuracy in proportions and contours; indeed no one but a sculptor will realize how many subtle curves and troublesome details occur on the surface of a fish. In order to indicate the fins adequately, many plans were devised: one of these

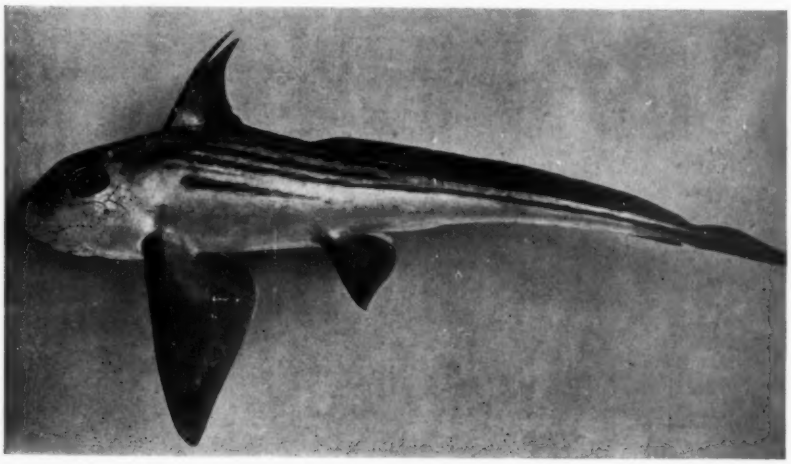
THE SPOONBILL STURGEON GROUP IN THE GALLERY OF FISHES (CLEVELAND H. DODGE FUND)

The group represents a school of spoonbill sturgeon or paddlefish swinging around into the seine of the fisherman [the group is a large exhibit, the glass front of the case measuring 9 feet 4 by 3 feet 1]. Field work on the lower Mississippi in 1910 and supervision of the group by Dr. Louis Hussakof, associate curator of fishes. Casts and color work by Mr. Dwight Franklin; background by Mr. Albert Operti

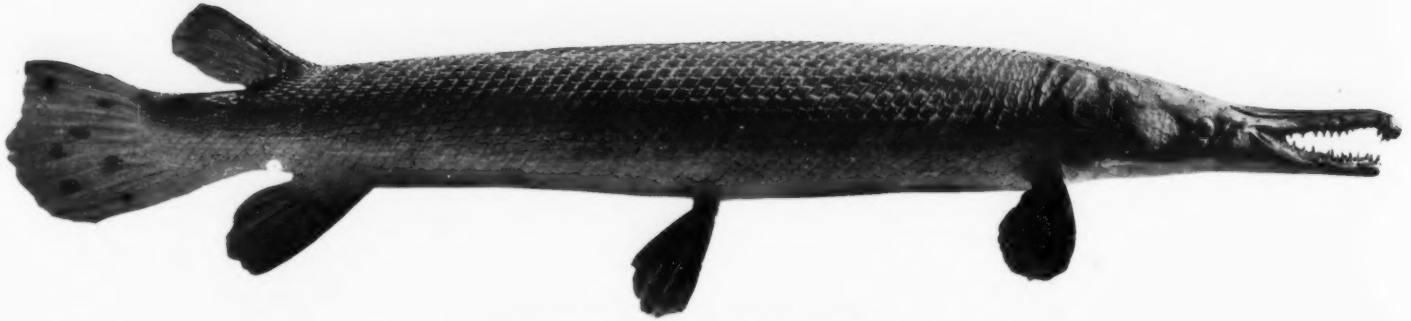
consisted in casting the fins in wax and mounting the casts on a backing of thin metal. Another method (Mr. Horter's), which yielded delicate and permanent results, was to make the impressions of the fins in softened gutta percha which could then be vulcanized. In several of the models prepared, a combination has been arranged so that the body of a fish has been cast from the fresh specimen and upon this (a wax cast rather than a plaster one) actual fins have been mounted. The result has then been placed in the hands of colorists who have followed as far as possible living models, the New York Aquarium having furnished excellent facilities for this work.

Slime-eel, or hagfish, *Homea stouti*. Model showing this fish wound around a long trawl line and enveloped in a profuse secretion of slime. Hagfishes have the simplest type of a skeleton, and in numerous regards typify the "fish" from which all other fishes descended

A number of the specimens lately completed in the museum would

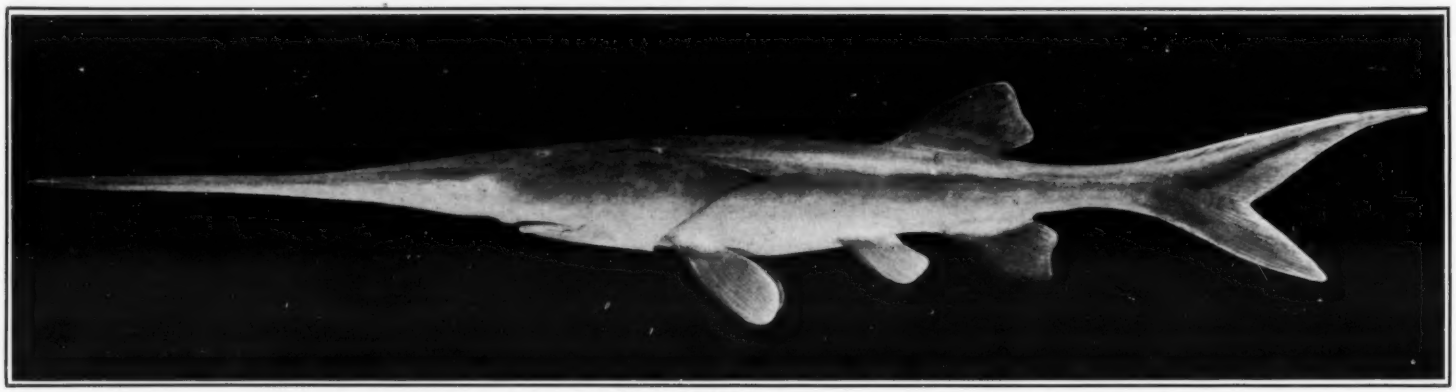


Model of a Japanese "ghost-fish," or chimæroid. This fish is now known to be a highly modified shark, not the oldest and most primitive form of existing fish, as sometimes maintained



MOUNTED SKIN OF THE ALLIGATOR GAR, *Lepisosteus osseus*

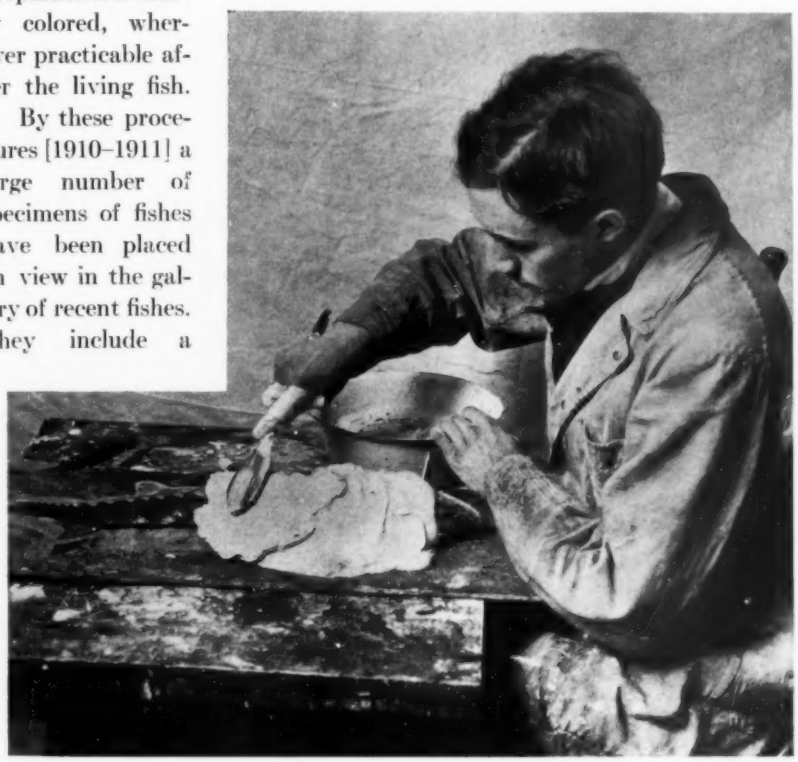
Specimen more than nine feet long taken in Moon Lake, Mississippi (Dodge expedition). The gar is a survivor of a numerous tribe of fishes, "ganoids," which flourished during the Age of Reptiles



MODEL OF THE CHINESE PADDLEFISH, *Psephurus gladius*, A LONG-NOSED STURGEON WHICH HAS LOST ITS SCALES

give an adequate representation of the animal in lifelike pose and colors, were it not for a single and fatal objection: the "fish" is after all only a model, and we have sometimes a suspicion that it belongs in a museum not of natural history, but of art. The best result is clearly forthcoming when some method is discovered which will make it practicable to retain the actual skin of the fish yet give it lifelike contour, texture and colors. Efforts in this direction have not been lacking in the department of preparation; and especially successful are the results obtained by Messrs. Franklin and West, who have shown a friendly rivalry in their work. It was found first of all that only those fishes could be well mounted which were freshly killed, for the slightest drying or decomposition alters at once the colors and texture of the skin. The best specimens have been prepared in the following way: a mold of the fish is first cast in plaster; the skin is then removed and placed in the freshly made mold. A preparation is next introduced which presses the skin against the mold, or matrix, filling out the skin completely. By this means the skin when dried retains exact contours. The preparation is finally colored, wherever practicable after the living fish.

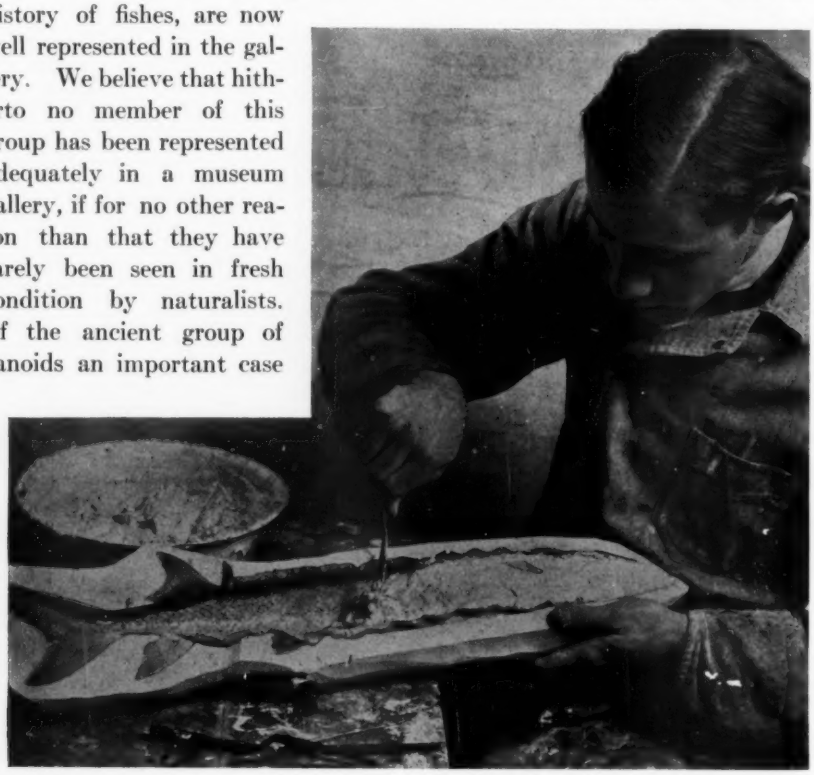
By these procedures [1910–1911] a large number of specimens of fishes have been placed on view in the gallery of recent fishes. They include a



The first stage in preparing a fish mount. Mr. Dwight Franklin has partly embedded one side of a sturgeon in clay, and is covering the exposed side with plaster

series of more than a dozen kinds of hagfishes and lampreys, a race of fishes standing near the base of the genealogical tree of the back-boned animals. In one instance there is represented a hagfish attached to a trawl line, coiled tightly about it, and secreting a great mass of slime characteristic of these primitive "eels." A number of shark models have been prepared, including characteristic examples, like the frilled shark of Japan (which, by the way, is the only living type of a family of vertebrates dating from the Coal Age); or the curious long-nosed shark, *Scapanorhynchus*, long known from the chalk epoch and lately found living in the deep waters off Japan. Among lungfishes we have now examples of all surviving forms, including a good model of the South American *Lepidosiren*, which breathes both by lungs and by gills. The particular specimen modeled was collected during the breeding season, when it develops a great number of hairlike processes from its hinder fins. These are blood-red in color and serve, it appears, to aërate the mass of eggs around which the fish coils.

The rare and curious "ghost fishes" or chimæroids, important in the history of fishes, are now well represented in the gallery. We believe that hitherto no member of this group has been represented adequately in a museum gallery, if for no other reason than that they have rarely been seen in fresh condition by naturalists. Of the ancient group of ganoids an important case



The skin of the fish is placed in the plaster jacket and pressed into place by a filling of composition

has now been prepared. Especially noteworthy is the Chinese spoonbill sturgeon, *Psephurus gladius*, now for the first time modeled. Of the American spoonbill, *Polyodon spathula*, which is rapidly being exterminated by the caviare fishermen, a habitat group has recently been placed on view. It represents a school of these large fishes swinging around into the seine of the fisherman; another ganoid, the garpike, appears at the left poised high in characteristic position, while below are catfish, carps, perches, herrings and drumfish—giving a comprehensive picture of the fish life of the lower Mississippi. This group is one of the results of the Dodge expedition of two years ago.

A DISCOVERY IN THE FOSSIL FIELDS OF MEXICO

By Barnum Brown

THE state of Jalisco, Mexico, is traversed north and south by low ranges of mountains interrupted at intervals by short rivers that flow into the Pacific. One of these, the Ameca, rises about fifteen kilometers west of Guadalajara in a valley at first open but shut in farther on by low mountains. During Pleistocene times the outlet of this valley was blocked long enough to allow a shallow lake to be formed in which sediments collected and the remains of many animals then inhabiting the country were preserved. These lake and river sediments now appear as terraces of clay, gravel and volcanic débris along the foothills.

Searching the terraces for fossils in the winter of 1910, I found remains of several different species of mammals, turtles and fishes, the most interesting of all discoveries being a complete carapace of a large glyptodont, an animal related to the armadillos. Different genera of glyptodonts existed during Miocene, Pliocene and Pleistocene times, ranging in distribution from Patagonia to northern Texas, Florida and California, and were especially numerous on the pampas of Argentina during the Pleistocene. It is a curious coincidence that the range of distribution of this order of animals covers the territory influenced by the Spanish tongue in the Americas.

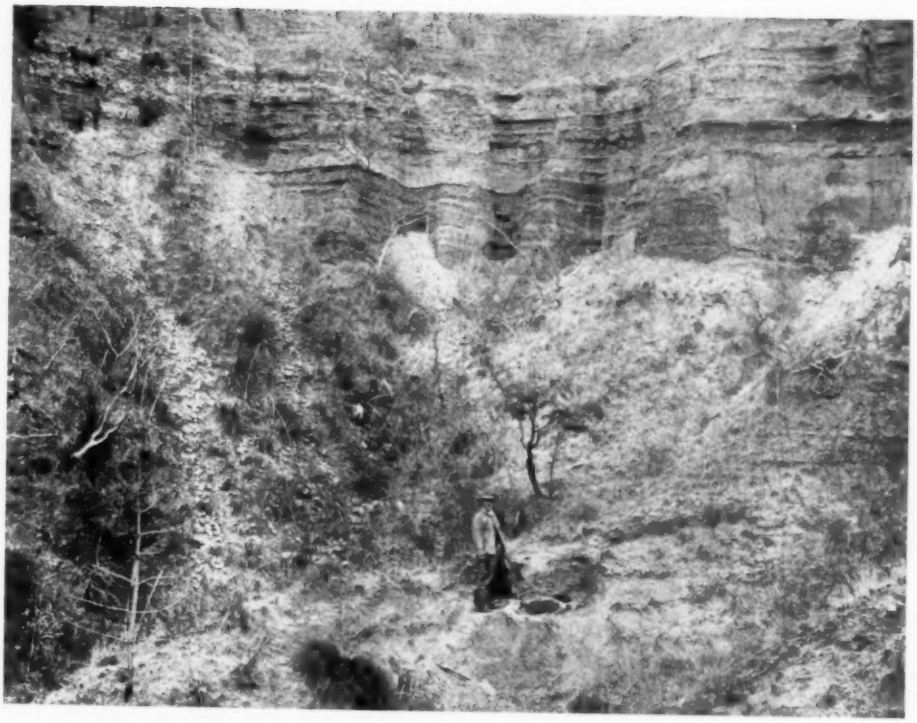
The new specimen was found on the San Miguel ranch twelve miles west of Ameca. As the Madero revolution was in progress at the time of the discovery, I did not as usual camp near the spot where the work was to be done, considering it safer to sleep in the town with its little colony

Complete carapace of the new glyptodont *Brachyostracon*, four feet eight inches long, three feet one inch high

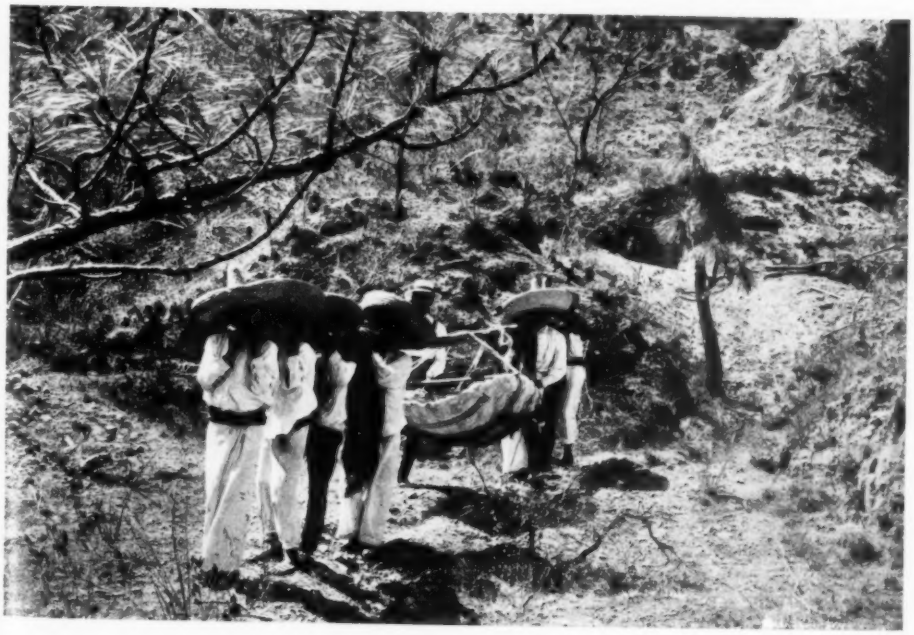
of half a dozen American families. Thus there was a ride to and from the specimen, which consumed several hours each day, but the changing rural scenes more than compensated for the loss of time. Every mile was through scenes primitive as in Bible times. It is difficult to realize that within four days' travel from New York, people are using the methods of soil culture employed two thousand years ago. In the valley, white-clad men cultivated the fields with wood pointed plows drawn by oxen, or planted sugar cane, while on the hills and high above on the mountain sides others worked in the fields of century plants from which *tequile*, the native alcoholic drink, is brewed.

The peon field hand is a picturesque figure in his white cotton shirt and trousers, with a straw sombrero and fibre sandals. A bright red blanket over his shoulder serves as a coat when the air is chill, and at night is his bed. In the early hours of the day groups of blanketed figures shuffle along the road to and from town, some carrying immense loads on their heads or backs. But the burro is the common carrier of the mountainous districts. What the camel is to desert Africa, the burro is to Mexico. Caravans file over the mountain trails loaded with bales, boxes and lumber. At first sight it is rather disconcerting to see a stack of hay or a shock of corn moving along the road apparently of its own volition. Closer scrutiny however reveals four tiny feet underneath, sufficient evidence that a burro is the motive power.

Straggling groups of adobe huts and thatched shelters of the peons are



Partly dug-out glyptodont carapace in a region of terraced Pleistocene gravel beds



Eight peons carrying the fossil down to the road

scattered along the streams and at springs. On wash days the women congregate along the streams, washing the clothes on flat stones — often the same stones on which they grind their daily corn.

Having had fossils injured by curious natives in northern Mexico, I feared that harm might come to this valuable specimen if found by them, so exercised considerable care to ride to it unobserved until it should be completely prepared for transportation. When ready for shipment it weighed over four hundred pounds. The work of carrying the fossil to Ameca proved a considerable problem. An ox-cart, because of its uncertainty was not to be considered, therefore the mail-carrier of the town was persuaded to transport the fossil in his wagon — that is, from the point where the road began. From the bad lands down to this road eight peons carried the specimen suspended from a pole, making a picturesque group, as are all seen along Mexican roads. Before this discovery there were in existence two glyptodont carapaces from the valley of Mexico, both preserved in Mexico City. They with this third specimen from Ameca show characters in the teeth, pelvis and carapace that distinguish the Mexican glyptodonts from known South American genera. On account of the peculiar shape of the carapace, which is short and high, this genus has been named *Brachyostracon*.

In the valleys white-clad men cultivate the fields with wood pointed plows drawn by oxen

What the camel is to desert Africa, the burro is to Mexico

EARLY MAN IN AMERICA

THIRTY YEARS OF EXPERIENCE IN SEARCHING FOR EVIDENCES OF THE ANTIQUITY OF MAN IN THE DELAWARE VALLEY [1]

By Ernest Volk

FOR the last half-century the question of man's antiquity in America has kept the scientific world busy. In the first place the pioneers of prehistoric archæology made very important finds in England and France in the shape of artificially fractured flints. These were found in glacial gravel and upon claiming them as the handiwork of man, the discoverers were vigorously assailed as to their veracity. Gradually however, evidence of such overpowering weight accumulated that it finally triumphed over criticism.

Exactly the same unpleasant experience was in store for archæologists in America, but fortunately in this as elsewhere in life, patience and perseverance are valuable capital. It is this capital that has drawn a large interest in the search for traces of early man in the Delaware Valley, where indeed unlimited patience was needed, day in and day out during weeks and months barren of result. Thousands of feet of earth, sand and gravel were removed with the trowel and carefully searched for specimens. Each day's work was begun with a new hope, which lived only to be buried at evening and resurrected again each following morning. Thus the archæologist becomes a veritable "Micawber," always hoping "for something to turn up."

Thirty years of a man's life seem a long time to look for a certain thing, but when a subject becomes so well established that it fills his mind, years fly like days. The last twenty-two of my thirty years' search were under the direction of Professor F. W. Putnam of Harvard University, who with untiring interest and love for the work has always succeeded in soliciting new funds for the explorations which have finally brought results.

The glacial deposits are a very prominent feature at Trenton, the city actually being built upon the glacial drift which forms a bank of from forty to sixty feet high near the Delaware, extending southeast and then south for miles until finally lost. Of these deposits the Trenton gravel has a thickness of thirty to forty feet near the river and gradually thins out as it extends eastward. It is composed of coarse and fine sand and gravel with large boulders both water-worn and angular, varying from six to forty

[1] Editor's note.— THE ARCHÆOLOGY OF THE DELAWARE VALLEY. By Ernest Volk. 8vo., pp. 258, plate 127. Published by the Peabody Museum, Harvard University, 1911.

Mr. Ernest Volk, field archæologist, has published in this volume with fascinating detail and clearness many notes from his field journal. These together with his conclusions are of exceedingly great interest not only to the technically trained archæologist but also to the average reader interested in the history of the human race in America.

and more inches in diameter. The whole is stratified and shows in addition to the large boulders, a peculiar feature much like a pit but which, from my point of view, cannot be mistaken for an ordinary pit, being rather an ice pit, a place once occupied by a large cake of ice. This ice stranded there and melting gradually, the while the stratum overlying it was being laid down, finally disappeared altogether, and its place was taken up by material from said stratum above. All ice pits found have been near the top in the last layer of sand. The deposit of the Trenton gravel is topped by a *yellow loam*, varying in thickness from two to five feet and is a combination of loam, fine sand, clay and iron. On top of this yellow loam is the so-called *black soil*, the surface at the present day. This is chiefly the accumulation of decayed vegetation and varies in thickness from six to thirty-six and more inches according to the adaptability of the location to plant growth.

The long search on this glacial terrace has brought traces of the presence of early man, of which the black or top soil shows the following evidence: numerous force-broken quartzite pebbles, chips and flakes of various minerals such as argillite, chert, hornstone, jasper, quartz and quartzite, detached in the manufacture of implements; also the implements themselves, whole and broken, and occasionally fragments of animal bone and small fragments of pottery. This black soil has been disturbed by human agency and penetrated downward into the underlying yellow loam in pits, postholes, ashbeds, hearths and graves.

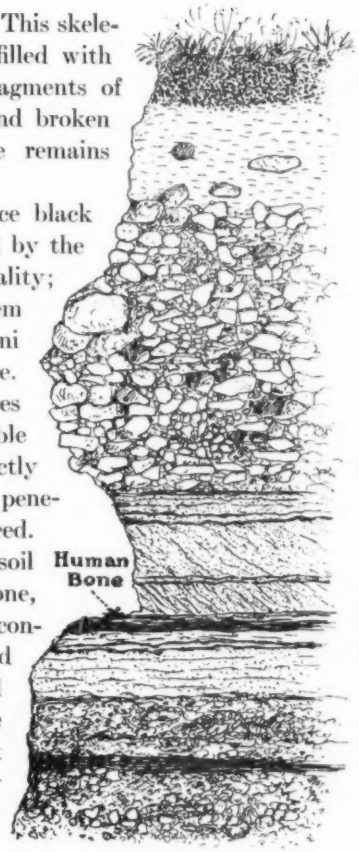
The pits are of various depths from one to five feet and of a diameter from six to sixty inches and contain charcoal, broken pottery, fragments of animal bone, whole and broken implements, plant and fruit remains, nutshells and whole and broken pebbles, of which many are burnt and fire-fractured. The hearths contain single and double layers of pebbles, whole, burnt and fire-broken. The ashbeds are generally the depth of the shallow pits and contain a large amount of ashes with fragments of animal bone among which are recognized the bones of Virginia deer, of bear, wolf or fox, beaver and opossum, wild turkey, wild goose or duck, of the sturgeon, shad, catfish and turtle. These ashpits are clearly the evidences of large feasts.

The graves were of three kinds according to depth. The shallow graves were those where the body had evidently been laid upon the surface and the ground or earth heaped over it forming a low mound which has generally been disturbed by the farmer's plow. The medium graves had a depth of from eight to twenty inches below the surface and the deep graves from two to three feet. The skeletons found show that bodies were buried in various positions, on the side with knees drawn up toward the body prevailing. In some instances the body was straightened out on the back with arms at the side. In one exceptional case the body had been placed in a sitting

position with knees somewhat drawn up. This skeleton was covered by two feet of ashes, filled with broken pots and bone implements, with fragments of animal bone, with mussel shells, charcoal and broken stone implements, all very evidently the remains of a feast.

Such traces of occupancy in the surface black soil are to be referred to the Indians found by the Europeans when first arriving in this locality; the tribe was called the Delawares by them but the Indians called themselves the "Leni Lenapés," "original people" in their language. All excavations made by these Delawares below the top black soil are plainly traceable in the underlying yellow loam, just as distinctly as black ink shows on white paper; even the penetration of surface vegetation can easily be traced.

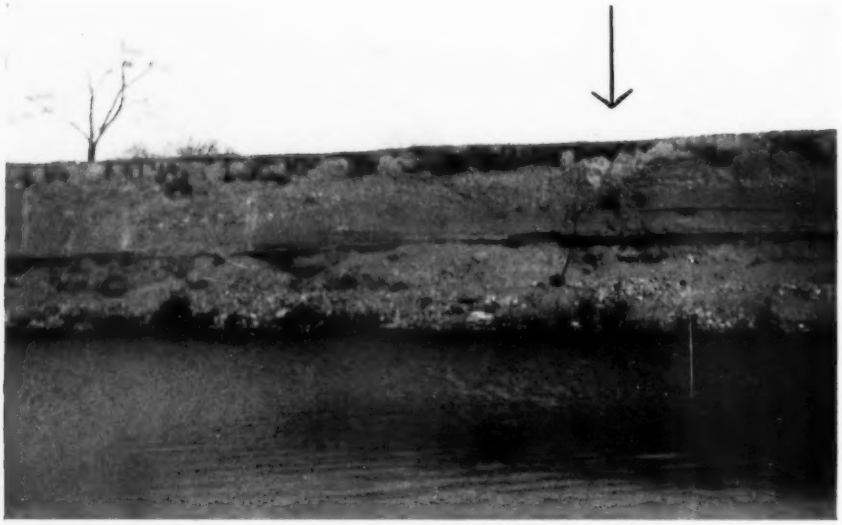
The yellow deposit underlying the black soil also shows traces of man's occupancy in stone, animal bone and human bone, but no connection is found between these specimens and those heretofore described. There is a total absence of pottery. Nor is there any trace whatsoever of an intrusion from the black soil. The pits found show clearly that they were excavated from a lower level in the yellow soil than those which carry intrusions of the black soil, as the red clay bands deposited by water covered the mouths or openings of these pits. The pits contained broken quartzite pebbles, small particles of charcoal and one, the bones of the American bison with charcoal particles and fire-broken stone.



Cross section of layers of soil in the Delaware Valley, and human remains in the glacial deposit where have been found the bones of musk ox and other Arctic animals

Such traces of man's presence in the yellow soil were found during a number of years for a distance of several miles, and include chips and flakes of argillite and implements of the same material in shape of slender spear heads and arrow points. Besides the scattered specimens and the specimens in pits there were specimens found close together in patches of three feet diameter and more, representing places where the chipping of the argillite was done. But not until April, 1899, did we find the bones of man belonging exclusively to this deposit, and as many a time is the case, these were accidentally found in a trench excavated for the purpose of ascertaining the thickness of the Trenton gravel at its eastern end. There were two heaps of human bones some feet apart, six feet below the present surface, one in

Ice pits in cut south of Trenton, with large water-worn boulders in position



Railroad cut where human femur was found in glacial drift, 7 feet 7 inches below the surface. This bone is on exhibition in the American Museum, New Jersey section of the archæological hall (second floor)

a stratum of clay and the other in a stratum of manganese that had saturated the bones and made them very heavy; all were in a bad state of preservation.

The traces of man in the gravel, far below the above-named two stations of occupation, were found in the shape of artificially fractured stone chiefly

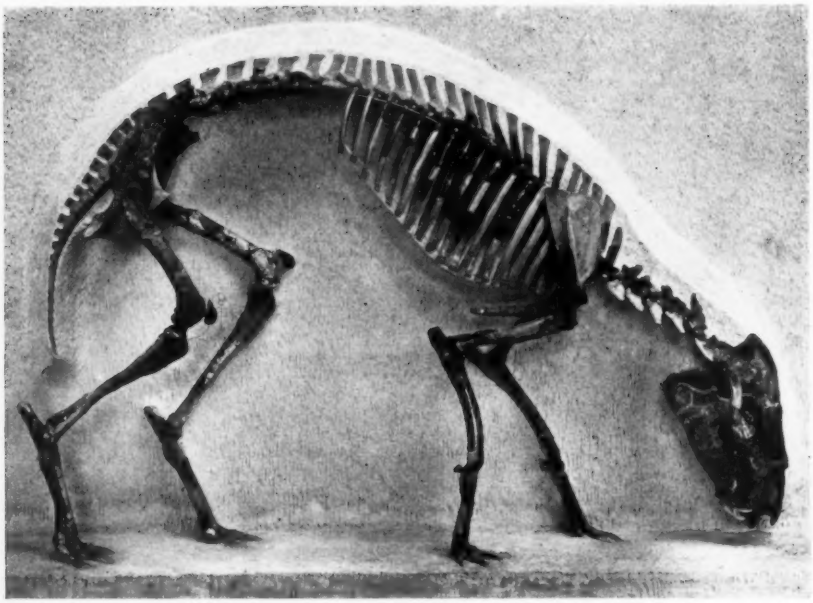
of argillite and quartz, at various depths in undisturbed gravel, also the bones of Arctic animals such as musk ox and of elk, probably species now extinct, but which were contemporaneous with the man whose remains are found in the same deposit. And finally, in November, 1899, after so many years of search the work was crowned by the finding of human bones in the same glacial deposit where the bones of Arctic animals were found. The find consisted of a fragment of the left femur of a human skeleton. The cellular structure had been gouged out, one end cut off and two holes were drilled into the sides of the bone, which indicates that the same may have been the handle of a tool or weapon at some time in the remote past and removes any possibility for doubt: not only was it a human bone, but it was also a sample of man's handiwork. All animal matter had gone out of the bone and the whole was water-worn and rounded off at the ends, and of the consistency of chalk. Some fragments of the parietal bone of a human cranium were also found in the same deposit and were of the same consistency as the femur.

The fact that these finds were made in undisturbed gravel deposited by the glacial floods shows that the home of these people had been somewhere farther up the valley, and that the objects shared the journey of the gravel down to the place where they were now found, that they were a part of this gravel and as old as the deposits they were found in, whatever the age of the gravel may be.

We have here now the traces of three distinct habitations of man in the Delaware Valley: the Indian on the present surface, the black soil; some prehistoric man when the yellow soil was the surface prior to the accumulation of the black soil, and as this man used only argillite in the manufacture of his implements, he may be termed the "argillite man"; and finally a still older race before the yellow loam was deposited, the so-called "glacial man" or "gravel man."

However important these facts may be, they are at their best only meagre information and it is hoped that much more can be learned through future explorations. Continued search must reveal still other facts on which to build the history of man on the American continent.

Most of the specimens mentioned which go to prove the three periods of occupation in the Delaware Valley are on exhibition in the American Museum of Natural History, and the explorations were made possible by or through the generosity and interest of Dr. Frederick E. Hyde of New York City and of the Duke of Loubat.



THE NEW FOUR-TOED HORSE SKELETON

By W. D. Matthew

THIS skeleton, presented by Mr. Frank K. Sturgis, represents the earliest known stage in the ancestry of the horse. It was found in 1910 in the Wasatch formation of the Big Horn Basin of Wyoming.

Three skeletons of the little four-toed horse of the Eocene period are now on exhibition. The first, from the Wind River formation, was one of the gems of the Cope collection, purchased by the Museum in 1894. The second, found by the Museum expedition of 1905 in the Bridger Basin, represents a later stage of evolution, the middle Eocene. This third skeleton, found at a lower geological horizon, is an earlier stage than the Cope skeleton and although of somewhat larger size is more primitive in retaining on the hind foot tiny splint-like vestiges of the first and fifth digits, reminiscences of an earlier five-toed condition which have been completely lost by its successors. Although these vestigial splints are not preserved in this skeleton, their existence is indicated by articulating facets on the adjoining digits and in another partial skeleton of the same species found in 1911, one of the little splints is preserved entire.

Numerous specimens of jaws and teeth of these little four-toed horses have been secured by the persevering work of the American Museum field parties, but skeletons and skulls are exceedingly rare and this one, although by no means complete, is somewhat more so than any hitherto found. It has been restored and mounted in a grazing attitude by Albert Thomson.

THE SEVENTEEN-YEAR LOCUST GROUP

By John A. Grossbeck

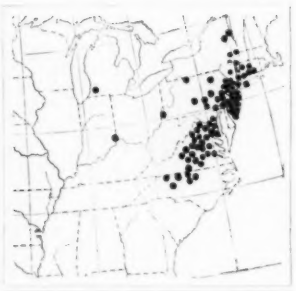
RECENTLY there has been installed in the insect hall a new group illustrative of the biology of the seventeen-year locust or periodical cicada (*Cicada septendecim* L.), the studies having been made in the early summer of 1911 when the insects appeared in such swarms in the vicinity of New York City.

The long life of the cicada, both as a larva and subsequently as a pupa, is passed in the earth at some distance beneath the surface where it feeds in both these stages on fluid food. In a "locust year," by which is meant the year in which the insects appear above ground, the active pupa, which stage is assumed six or seven years prior to appearance above ground, makes its way toward the surface and there awaits the advent of summer before breaking through the upper crust into sunshine and the outer air. When the latter part of May or the first part of June arrives, the uncouth creature emerges. At the same time incredible numbers of other pupæ have also emerged and attaching themselves to some surface, preferably to the trunk of a tree or to the undersides of leaves of shrubs, they shed the pupal skin and appear as winged cicadas.

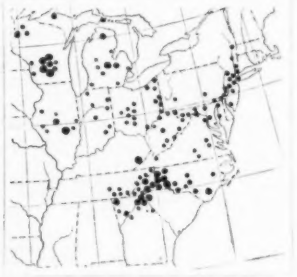
From the seventeen-year locust or cicada group. The cicada pupa emerges from the ground and ascends some tree trunk where it bursts the outer horny skin and crawls out an adult

Egg-laying begins in a few days after the emergence of the adults, and it is this process which results in the only injury caused by them. They select the slender terminal twigs of a great variety of orchard, shade and forest trees, for the purpose of depositing the eggs. Deep punctures are made in the twig, one immediately above the other, and in each puncture from twelve to twenty eggs are laid. These hatch toward the latter part of summer and the little grub-like

Distribution of eastern "locust" broods

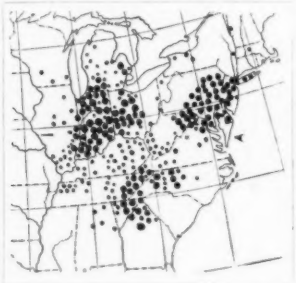


Brood II
Appeared 1911
Due again 1928

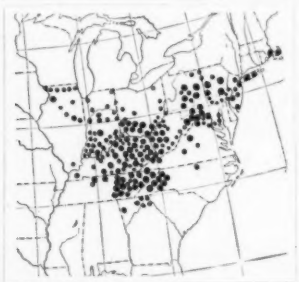


Brood VI
Due 1915 and
again in 1932

Brood VIII
Due 1917
and 1934



Brood X
Due 1919
and 1936



Brood XIV
Due 1923
and 1940

animals immediately drop to the ground and burrow into the soil to dwell in darkness until that subtle influence called instinct calls them into the outer world.

But ere these little fellows have broken through the eggshell the weight of the branch beyond the point at which the eggs were laid, aided by the wind, may have caused the twig to break, and the leaves beyond the break may then turn brown. The injury to a large tree, aside from the unsightly appearance of the dead leaves, is slight and the tree soon recovers completely; but small trees, especially seedlings are often killed. All in all, little apprehension need be entertained by the farmer or fruit-grower as a locust year approaches, for at most he must needs only forbear to plant young trees that year; and to the lover of the curious in nature a locust year is one looked forward to with great interest.

In the group now installed on the third floor the insects are shown emerging from the ground through neat circular openings on a level with the surface where the soil is compact and bare of vegetation, and through the tops of mud towers or "cones" which the young cicadas have constructed where the soil is moist, particularly where there is a layer of leaves or grass. On the trunk of a sweet gum tree and on some of the leaves of the scrub white oak nearby are numerous shed pupal skins, and adults delicate and white are seen breaking through the skins, or expanding their wings after having just emerged. Fully colored adults, blackish conspicuously marked with red, are shown resting on the twigs, some in the act of egg-laying. Certain of the insects in the group are represented as affected by the fungous disease known as *Massopora cicadina*. Also egg punctures are shown on some of the twigs, and the result of these in the broken twigs with dead leaves is conspicuous among the fresh summer foliage.

An English sparrow, that inveterate destroyer of the cicadas among the many birds

that prey upon them, has just captured one of the insects, and hosts of cicada wings (which are not eaten by the birds) are strewn on the ground. A nest of the ant *Formica fusca subsericea* is shown also with the ants feeding on the dead bodies of the cicadas. The cicadas are too large to be carried into underground galleries, so are merely dragged to the entrance of the nest and eaten there.

A small variety of the cicada which has been named *Cicada cassinii* and occurs locally in nature with the large form is shown in one corner of the group.

Twig punctured for egg-laying. Photographed from cicada group

MUSEUM NOTES

SINCE the last issue of the JOURNAL the following persons have been elected to membership in the Museum:

Patrons, MRS. ARCHER M. HUNTINGTON, DR. CHARLES E. SLOCUM and MR. FRANK K. STURGIS;

Life Members, MRS. EDGAR S. AUCHINCLOSS, JR., MRS. GHERARDI DAVIS, MRS. W. B. DINSMORE, MRS. WILLIAM F. MILTON, MRS. JAMES M. VARNUM, MISS MARIE LOUISE CONSTABLE, MISS ANNA J. PIERREPONT, MISS E. LOUISE SANDS, MISS HARRIET WADSWORTH and MESSRS. CARROLL BALDWIN, THOMAS G. BENNETT, JOHN R. BRADLEY, EVERSLEY CHILDS, JOHN LYMAN COX, GLENN FORD MCKINNEY, EDWARD LUDLOW PARKER, JAMES S. WATSON, J. GRISWOLD WEBB, WILLIAM P. WHARTON, WILLIAM WILLIAMS and EDWIN O. WOOD;

Sustaining Members, MRS. ROBERT F. BALLANTINE, MRS. G. GRANVILLE WRIGHT and MESSRS. W. C. BROWN and E. W. VANDERHOOF;

Annual Members, MRS. HENRY A. ALEXANDER, MRS. WILLIAM ALEXANDER, MRS. C. VANDERBILT BARTON, MRS. E. J. BERWIND, MRS. JOHN E. BORNE, MRS. GEORGE B. CASE, MRS. ALICIA D. CONRAD, MRS. THOMAS CRIMMINS, MRS. JOHN M. DILLON, MRS. CHARLES D. HALSEY, MRS. ENOCH PRATT HYDE, MRS. J. F. MCKEAN, MRS. CHARLES E. PROCTOR, MRS. GEORGE ROSE, MRS. H. L. SATTERLEE, MRS. GEORGE E. SCHANCK, MRS. GRACE LEE SMIDT, MRS. JOHN WOOD STEWART, MRS. C. W. TRUSLOW, MRS. ALFRED TUCKERMAN, MRS. ARTEMAS WARD, MRS. HENRY B. WILSON, MRS. T. DENON WILSON, MISS RUTH AUCHINCLOSS CHILD, MISS M. KATHARINE HUSTED, MISS ELIZA B. MASTERS, MISS CONSTANCE PULITZER, MISS JULIA L. WALDO, MISS MARGARET S. WHITNEY, REAR ADMIRAL C. H. DAVIS, DR. JOSEPH D. BRYANT, DR. MARTIN COHEN, DR. R. B. CONTANT, DR. ROBERT JOHNSTONE KAHN, DR. HARRIS KENNEDY, DR. JAMES STEPHEN LEMON, DR. HUGO LIEBER, DR. HUGO SCHWEITZER and MESSRS. GEORGE

W. Bacon, Edward L. Ballard, Lemuel C. Benedict, S. N. Bond, Leon Durand Bonnet, Hilary R. Chambers, George L. Cheney, Harris D. Colt, Charles S. Cook, Jennings S. Cox, Morgan Davis, B. Delin, Samuel R. Dorrance, William Harris Douglas, Edward F. Eberstadt, Ezra H. Fitch, Richard E. Follett, Aaron V. Frost, G. H. Gentzel, Henry G. Gray, Kalman Haas, F. B. Hoffman, Clement S. Houghton, Wilson S. Howell, A. C. Huidekoper, Walter Kerr, Roland F. Knoedler, Reginald B. Lanier, J. Lawrence McKeever, G. H. Middlebrook, Martin H. Murphy, Hugo Newman, John E. Nicholson, William H. Parsons, T. H. Hoge Patterson, John J. Paul, John C. Powers, James McAlpine Pyle, William Rauch, Wallace Reid, Sylvan E. Rosenthal, Arthur Sachs, H. J. Schwartz, Edmund Seymour, W. Hinckle Smith, Enrico N. Stein, Theron G. Strong, Louis S. Stroock, Edward Graham Taylor, William R. K. Taylor, Stephen Dows Thaw, William Lyman Underwood, Reginald C. Vanderbilt, Tertius Van Dyke, Carl Vietor, W. G. Walker, J. McLean Walton, and R. Thornton Wilson.

At the regular meeting of the board of trustees on May 6, 1912 the following patrons of the Museum were elected associate benefactors in recognition of their generous contributions and continued activity in the growth of the institution: George S. Bowdoin, Cleveland H. Dodge, Archer M. Huntington, Arthur Curtiss James, Charles Lanier, Joseph F. Loubat, J. Pierpont Morgan, Jr., Henry Fairfield Osborn, Percy R. Pyne, William Rockefeller, Jacob H. Schiff and Felix M. Warburg.

The Museum was visited on April 9 by a committee from the Deutsches Museum of Munich, consisting of Director Oskar von Miller and ten of his associates. The committee was received by the president and director of the American Museum and by Mr. Felix M. Warburg of the board of trustees, the last-named always a great admirer of the work of administration and exhibition as carried out in the Deutsches Museum. It is inspiriting to the Museum that it was this American institution and its published plans for future extension that were said to have been the determining factors in deciding the Munich committee to visit the United States; and also to hear now that this committee maintains after visiting the large cities from the Coast to the Middle West that "of the works of man, they saw nothing equal to the American Museum in New York City" — all of which augments the institution's zeal to be worthy such distinction.

The forty-third annual report of the president of the American Museum of Natural History, issued in February as a preliminary report to the trustees and members of the institution and to the municipal authorities of the city of New York, was published in permanent form during the past month. The volume is particularly instructive as to the Museum's administration and support as well as in regard to its work in exploration, research, exhibition and education.

THROUGH the African field work of Mr. Carl E. Akeley the Museum is enriched by a series of ten skulls of the African elephant ranging in size from the yearling to the old tusker of perhaps thirty-five years, the skull measurements showing increase in width from twelve inches to thirty-five and in length from sixteen inches to forty-five. Examples of this species of elephant are more rare in museums in America than of even the mastodon, and thus unusual value is attached to this new and very extensive series.

THE MUSEUM has received from Mr. Alfred J. Klein skins and skeletons ready for mounting of a pair of the very remarkable giant forest pigs, *Hylochœrus meinertzhageni*. This species was discovered in 1898 in the wilds of British East Africa and is somewhat intermediate between the well-known wart hog and the river hog, being like the former in that the face of the male is characterized by a huge excrescence.

MR. CLARENCE H. EAGLE of New York City has presented to the Museum his private collection of about eight hundred bird skins representing North American species. These will be known as the C. H. Eagle collection and like other collections in the Museum will be accessible to students.

THE department of geology has recently come into possession of some interesting meteorites which are now on exhibition in the foyer. The largest of these is an entire mass of the so-called Amalia siderite or iron meteorite, which is held to be a portion of the great Mukerop find, receiving its name from the farm near Gibeon, German Southwest Africa, on which it was discovered. This mass weighs 675 pounds and forms an interesting companion-piece to the model of the Gibeon mass from the same region. A polished and etched section of Amalia is displayed in connection with the large mass and shows some most interesting characteristics, chief among which may be mentioned the curving of the Widmannstätten lines in certain portions of the mass, and a line of discordance running across the plate in such manner as to suggest that the original mass had been broken and welded together again before it struck the earth or that it consisted of two parts that were welded together. The other accessions are: a 370-gram, polished slice of the Lampa aërolite or stone meteorite, from the desert of Atacama, South America; a 457-gram, polished section of the Cullison aërolite, from Pratt County, Kansas; and a 567-gram, polished and etched slice of the Shrewsbury siderite, from York County, Pennsylvania. All of these are newly-described finds and are valuable additions to our collection.

FOUR new radiolarian models prepared by Mr. H. Müller have recently been placed on exhibition by the department of invertebrate zoölogy. The glasslike skeletons of these minute sea animals are represented enlarged 1500 to 2000 diameters and show clearly their delicate and intricate struc-

ture. While the radiolarians are so small as to be scarcely visible to the unaided eye, yet they are so abundant in the warmer oceanic waters that the skeletons of their past generations cover the ocean floor to a considerable depth and may form a layer compacted into flinty "Barbados earth" which is used commercially for polishing and finishing.

An addition to the series of fishes on exhibition in the Museum is a case containing models of certain species that live in depths of the sea one or two miles below the surface where no light penetrates. Many of them are provided with special phosphorescent organs arranged along the sides or in some cases at the ends of fleshy filaments, like minute lanterns on long poles to light the sea bottom or to lure prey. The models represent some of the remarkable forms which have been obtained in the course of the work of the "Albatross" and other vessels equipped for deep-sea dredging. They were purchased from the modeler who made the original series for the British Museum and have been altered according to the researches of Dr. Bashford Dean and in part recolored by the Museum artists.

The department of anthropology has issued to artists and teachers of art classes in New York City and vicinity a card calling attention to the remarkable collection of prehistoric Peruvian cloths recently put on exhibition in the South American gallery. Not only are these mummy cloths of unusual beauty but they also present an opportunity to study the evolution of primitive designs and color schemes.

During the coming summer Dr. Frank E. Lutz will continue the study of the invertebrates of the vicinity of New York City paying especial attention to the Ramapo Mountains and Pine Barren regions of New Jersey.

Dr. Herbert J. Spinden, assistant curator of anthropology, is on a Museum expedition in the Southwest. In January he visited the ruins of Copán in Guatemala returning to the Southwest to study the little-known remnants of Pueblo tribes formerly living on the lower Rio Grande in the vicinity of El Paso. He is now among the Rio Grande Pueblos proper near Santa Fé taking up again the work of former years on decorative art and material culture.

The department of anthropology reports progress in local archæological discoveries. Mr. William Floyd of Long Island, while looking for archæological remains on his estate uncovered an Indian burial, the skeletons from which he has presented to the Museum. The grave contained three skeletons, one apparently that of a girl, the others of two middle-aged men. As is the case with most burials in this vicinity, no objects of any kind were found in the graves. Mr. Max Schrabisch of Paterson, New Jersey, has again begun his search for rock-shelters and reports the finding of a very important one near Stony Point, New York. The excavations of this shelter so far have been rewarded with rich finds of pitted hammerstones, knives, scrapers and pottery.